

US-PAT-NO: 6430053  
DOCUMENT-IDENTIFIER: US 6430053 B1

TITLE: Pluggable transceiver module having rotatable  
release and removal lever  
with living hinge

DATE-ISSUED: August 6, 2002

INVENTOR-INFORMATION:

| NAME               | CITY       | STATE | ZIP |
|--------------------|------------|-------|-----|
| CODE COUNTRY       |            |       |     |
| Peterson; Bruce A. | Schaumburg | IL    | N/A |
| N/A                |            |       |     |
| Medina; Raul       | Chicago    | IL    | N/A |
| N/A                |            |       |     |
| Peterson; Frank J. | Oak Forest | IL    | N/A |
| N/A                |            |       |     |

ASSIGNEE INFORMATION:

| NAME                   | CITY    | STATE | ZIP |
|------------------------|---------|-------|-----|
| CODE COUNTRY TYPE CODE |         |       |     |
| Stratos Lightwave      | Chicago | IL    | N/A |
| N/A 02                 |         |       |     |

APPL-NO: 10/ 022704

DATE FILED: December 13, 2001

INT-CL: [ 07] H05K007/00

US-CL-ISSUED: 361/728;361/754 ;361/759 ;361/732 ;361/740  
;439/352 ;439/357  
;439/483 ;439/609

US-CL-CURRENT: 361/728; 361/732 ; 361/740 ; 361/754 ;  
361/759 ; 439/352  
; 439/357 ; ~~439/483~~ ; 439/609

FIELD-OF-SEARCH: 361/728; 361/725 ; 361/729 ; 361/732 ;  
361/740 ; 361/747  
; 361/754 ; 361/759 ; 361/785 ; 361/798 ; 361/801 ; 439/607  
; 439/608 ; 439/609  
; 439/610 ; 439/483 ; 439/352 ; 439/357

## REF-CITED:

|           |               | U.S. PATENT DOCUMENTS |                    |
|-----------|---------------|-----------------------|--------------------|
| PAT-NO    | ISSUE-DATE    | PATENTEE-NAME         |                    |
| US-CL     |               |                       |                    |
| 4387956   | June 1983     |                       | Cline              |
| 250/96.2  | N/A           | N/A                   |                    |
| 4734049   | March 1988    |                       | George et al.      |
| 439/259   | N/A           | N/A                   |                    |
| 5734558   | March 1998    |                       | Poplawski et al.   |
| 361/752   | N/A           | N/A                   |                    |
| 5820398   | October 1998  |                       | Stabroth et al.    |
| 439/352   | N/A           | N/A                   |                    |
| 5879173   | March 1999    |                       | Poplawski et al.   |
| 438/138   | N/A           | N/A                   |                    |
| 5931290   | August 1999   |                       | Wehrli, III et al. |
| 200/400   | N/A           | N/A                   |                    |
| 6142828   | November 2000 |                       | Pepe               |
| 439/607   | N/A           | N/A                   |                    |
| 6149465   | November 2000 |                       | Berg et al.        |
| 361/728   | N/A           | N/A                   |                    |
| 6229708   | May 2001      |                       | Corbin et al.      |
| 361/725   | N/A           | N/A                   |                    |
| 6231145   | May 2001      |                       | Liu                |
| 312/223.2 | N/A           | N/A                   |                    |

ART-UNIT: 2841

PRIMARY-EXAMINER: Martin; David S.

ASSISTANT-EXAMINER: Bui; Hung

## ABSTRACT:

A pluggable transceiver module having a housing with a first side and a face perpendicular to the first side, and a tab extending beyond the surface of the first side, and the tab sized to mate with a slot in a receptacle of a host device for receiving the pluggable transceiver module housing, an elongated member slidably mounted to the first side of the housing and having an internal end and an external end, a wedge on the internal end of the elongated member, wherein sliding the elongated member inward causes the wedge to slide between the tab and the slot on the receptacle and remove the tab

from within the slot,  
thereby releasing the pluggable transceiver module from the  
receptacle, and a  
lever rotatably mounted via an axle proximate the face of  
the pluggable  
transceiver module, said axle being connected to the  
external end of the  
elongated member such that rotating the lever away from the  
face of the  
pluggable transceiver cause the rotating axle to push the  
elongated member  
inward and drive the wedge between the tab and the slot in  
order to release the  
pluggable transceiver module from the receptacle.

14 Claims, 7 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 6

US-PAT-NO: 6135793

DOCUMENT-IDENTIFIER: US 6135793 A

TITLE: Coupler for grounding of a modular transceiver  
housing

DATE-ISSUED: October 24, 2000

INVENTOR-INFORMATION:

| NAME              | CITY       | STATE | ZIP |
|-------------------|------------|-------|-----|
| CODE COUNTRY      |            |       |     |
| Babineau; Paul J. | Ashburnham | MA    | N/A |
| N/A               |            |       |     |

ASSIGNEE INFORMATION:

| NAME                   | CITY        | STATE | ZIP |
|------------------------|-------------|-------|-----|
| CODE COUNTRY TYPE CODE |             |       |     |
| 3Com Corporation       | Santa Clara | CA    | N/A |
| N/A 02                 |             |       |     |

APPL-NO: 09/ 383713

DATE FILED: August 26, 1999

INT-CL: [ 07] H01R004/66

US-CL-ISSUED: 439/92;439/95 ;439/101 ;361/753 ;361/799

US-CL-CURRENT: 439/92; 361/753 ; 361/799 ; 439/101 ; 439/95

FIELD-OF-SEARCH: 439/92; 439/95 ; 439/101 ; 439/108 ;  
439/64 ; 361/753  
; 361/799 ; 361/800 ; 361/816 ; 361/818 ; 174/51

REF-CITED:

|                |            | U.S. PATENT DOCUMENTS  |  |
|----------------|------------|------------------------|--|
| PAT-NO         | ISSUE-DATE | PATENTEE-NAME          |  |
|                | US-CL      |                        |  |
| <u>5747735</u> | May 1998   | Chang et al.           |  |
| 439/95         | <u>N/A</u> | N/A                    |  |
| 5752841        | May 1998   | <u>Hori</u>            |  |
| 439/108        | N/A        | N/A                    |  |
| <u>5879173</u> | March 1999 | Poplawski et al.       |  |
| 439/92         | <u>N/A</u> | N/A                    |  |
| 5906496        | May 1999   | <u>DelPrete</u> et al. |  |

439/95            N/A            N/A

ART-UNIT:    283

PRIMARY-EXAMINER:    Bradley; Paula

ASSISTANT-EXAMINER:    Davis; Katrina

ABSTRACT:

A resilient conductive coupler electrically couples a conductive housing of a modular transceiver to ground contacts of a printed circuit board. A transceiver carrier is mounted to a printed circuit board and the resilient conductive coupler is selectively positioned and mounted to the printed circuit board so as to make a low impedance electrical connection with ground contact pads of the printed circuit board. The resilient conductive coupler is sized and positioned such that a portion of the coupler wipes the conductive housing of the transceiver as the transceiver is slidably inserted into the carrier. The coupler electrically couples the conductive housing of the modular transceiver to the ground contact of the printed circuit board when the modular transceiver is seated within the carrier so as to minimize undesired emissions from the modular transceiver when the transceiver is operable.

13 Claims,    7 Drawing figures

Exemplary Claim Number:    1

Number of Drawing Sheets:    3

US-PAT-NO: 6304436

DOCUMENT-IDENTIFIER: US 6304436 B1

TITLE: Connector system with outwardly opening door for a  
removable  
transceiver module

DATE-ISSUED: October 16, 2001

INVENTOR-INFORMATION:

| NAME                    | CITY      | STATE | ZIP |
|-------------------------|-----------|-------|-----|
| CODE COUNTRY            |           |       |     |
| Branch; Scott Michael   | Rochester | MN    | N/A |
| N/A                     |           |       |     |
| Gaio; David Peter       | Rochester | MN    | N/A |
| N/A                     |           |       |     |
| Hanley; Michael Francis | Rochester | MN    | N/A |
| N/A                     |           |       |     |
| Hogan; William K.       | Rochester | MN    | N/A |
| N/A                     |           |       |     |
| Sendelbach; Paul John   | Rochester | MN    | N/A |
| N/A                     |           |       |     |

ASSIGNEE INFORMATION:

| NAME                   | CITY   | STATE | ZIP |
|------------------------|--------|-------|-----|
| CODE COUNTRY TYPE CODE |        |       |     |
| International Business | Armonk | NY    | N/A |
| N/A 02                 |        |       |     |
| Machines Corporation   |        |       |     |

APPL-NO: 09/ 454919

DATE FILED: December 3, 1999

PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATIONS Application Ser.  
No. 09/410,786, filed  
Oct. 1, 1999, entitled "REMOVABLE LATCH AND BEZEL EMI  
GROUNDING FEATURE FOR  
FIBER-OPTIC TRANSCEIVERS"; application Ser. No.  
09/391,974, filed Sep. 8,  
1999, entitled "GUIDE RAIL AND CAM SYSTEM WITH INTEGRATED  
LOCK-DOWN AND  
KICK-OUT SPRING FOR SMT CONNECTOR FOR PLUGGABLE MODULES";

application Ser. No.  
 09/216,104, filed Dec. 18, 1998, entitled "GUIDE RAIL AND  
 CAM SYSTEM WITH  
 INTEGRATED CONNECTOR FOR REMOVABLE TRANSCEIVER"; and  
 application Ser. No.  
 09/215,977, filed Dec. 18, 1998, now U.S. Pat. No.  
 5,980,324 entitled "GUIDE  
 RAIL SYSTEM WITH INTEGRATED WEDGE CONNECTOR FOR REMOVABLE  
 TRANSCEIVER"; are  
 related and are incorporated herein in their entireties by  
 this reference.

INT-CL: [ 07] H05K005/00

US-CL-ISSUED: 361/683;361/753 ;439/135

US-CL-CURRENT: 361/683; 361/753 ; 439/135

FIELD-OF-SEARCH: 361/732; 361/683 ; 361/752 ; 361/756 ;  
 361/753 ; 361/799  
 ; 361/800 ; 439/135 ; 439/136 ; 439/142 ; 439/297 ; 439/607

#### REF-CITED:

|         |            | U.S. PATENT DOCUMENTS |  |
|---------|------------|-----------------------|--|
| PAT-NO  | ISSUE-DATE | PATENTEE-NAME         |  |
|         | US-CL      |                       |  |
| 5767999 | June 1998  | Kayner                |  |
| 359/163 | N/A        | N/A                   |  |
| 5879173 | March 1999 | Poplawski et al.      |  |
| 438/138 | N/A        | N/A                   |  |
| 6062893 | May 2000   | Miskin et al.         |  |
| 439/374 | N/A        | N/A                   |  |

#### OTHER PUBLICATIONS

Co-pending patent application "Removable Latch and  
 Bezel EMI Grounding  
 Feature for Fiber-Optic Transceivers", Application Serial  
 No. 09/410,786, Filed  
 Oct. 1, 1999.

Co-pending patent application "Guide Rail and CAM  
 System with Integrated  
 Lock-Down and Kick-Out Spring for SMT Connector for  
 Pluggable Modules",  
 Application Serial No. 09/391,974, Filed Sep. 8, 1999.

Co-pending patent application "Guide Rail and CAM

System with Integrated  
Connector for Removable Transceiver", Application Serial  
No. 09/216,104, Filed  
Dec. 18, 1998.

Co-pending patent application "Guide Rail System with  
Integrated Wedge  
Connector for Removable Transceiver", Application Serial  
No. 09/215,977, Filed  
Dec. 18, 1998.

ART-UNIT: 289

PRIMARY-EXAMINER: Patel; Tulsidas

ABSTRACT:

A connector system for a removable transceiver module that interfaces with an electronic device, such as a computer, switch, subsystem, peripheral device, disk drive, tape drive and other input/output devices. The electronic device includes an enclosure having a bezel that has an opening for receiving the module. A circuit board is mounted within the enclosure. A guide member is mounted on the circuit board and is elongated between first and second ends along a first axis. A connector block is located at the first end of the guide member, while a door is pivotally mounted at the second end of the guide member. The module is slidably engageable with the guide member in a direction along the first axis. The module also includes electrical contacts electrically connectable with corresponding electrical contacts in the connector block. The door is pivotable between an open position exposing the opening in the bezel and a closed position where a portion of the door outside the enclosure covers the opening. The door effectively minimizes the likelihood of dust entering the electronic device. Preferably, to provide effective EMI shielding, the door and the bezel each



comprise an electrically  
conductive material and are configured to make electrical  
contact with each  
other when said door is closed. The door may be positively  
latched in the  
closed position and spring biased toward the open position.

The door  
preferably includes features for guiding and latching the  
module.

27 Claims, 27 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 25